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Helmut [DE/DE]; Dillenbergweg 4, D-65388 Schlangenbad (DE). HEITMANN, Kjell, Roger [DE/DE]; Dillenbergweg 4, D-65388 Schlangenbad (DE).

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(74) Agents: BIRD, William, E. et al.; Bird Goen & Co., Klein Dalenstraat 42, B-3020 Winksele (BE).

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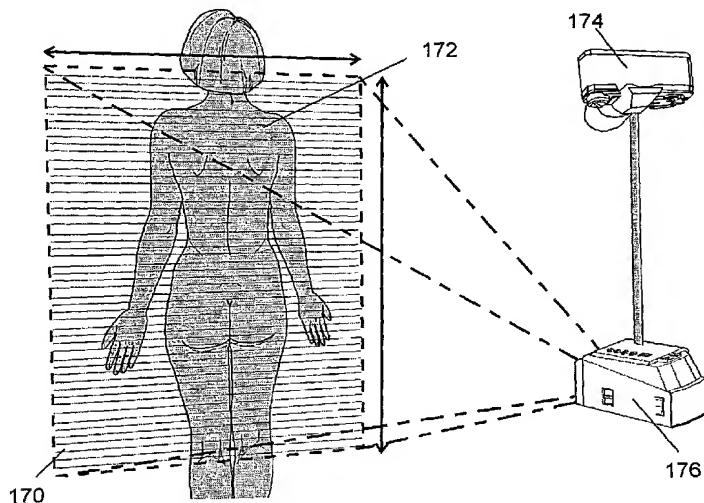
(71) Applicants (for all designated States except US): K.U. LEUVEN RESEARCH & DEVELOPMENT [BE/BE]; Groot Begijnhof, Benedenstraat 58, B-3000 Leuven (BE). DIERS INTERNATIONAL GmbH [DE/DE]; Max-Planck-Ring 41A, D-65205 Wiesbaden (DE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): HAEX, Bart, Maria, Jozef [BE/BE]; Leon Schreursvest 55, B-3001 Leuven (BE). VANDER SLOTEL, Jozef [BE/BE]; Langestraat 62, B-3190 Boortmeerbeek (BE). DIERS,

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(54) Title: TIME-DEPENDENT THREE-DIMENSIONAL MUSCULO-SKELETAL MODELING BASED ON DYNAMIC SURFACE MEASUREMENTS



(57) Abstract: Active contour models and active shape models were developed for the detection of the kinematics landmarks on sequential back surface measurements. The anatomical landmarks correspond with the spinous process, the dimples of the posterior superior iliac spines (PSIS), the margo mediales and the elbow. Back surface curvatures are used as a basis to guide the ACM and ASM's towards interesting landmark features on the back surface. Geometrical bending and torsion costs, and the main modes of variation of the landmark points are added to the models in order to avoid unrealistic curve shapes from a biomechanical point of view. Reconstruction of the underlying skeletal structures is performed using the surface normals as approximations for skeletal rotations (e.g. axial vertebrae rotations, pelvic torsion, etc.) and anatomical formulas to estimate skeletal dimensions.

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